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Abstract

Slums have been present in developing cities landscapes for quite some time. And while central and local governments continue their quest for making their cities slum-free, the overall outcome of slum policies is in most cases unknown or unclear. Some studies have revealed that slum policies might have unexpected benefits such as the improvement of children's health or household's access to credit. Yet, others have pointed unforeseen side-effects such as *poverty recycling*: where poor slum dwellers aren't able to maintain new living conditions and sell/rent their dwelling moving back to the slum. This paper focuses on the effects of slum rehabilitation on residential mobility in order to test the myth of *poverty recycling*. In order to do so, an exhaustive household survey was carried out in the city of Mumbai, comprising 510 households in 4 rehabilitated sites and 5 to-be-rehabilitated sites. Results show that the magnitude of *poverty recycling* is small and that in most cases slum rehabilitation actually serves as a platform to attain better living conditions both for those who left as for new comers.

1 Introduction

70 millions inhabitants are added each year to cities worldwide or the equivalent of creating 7 new mega-cities from scratch. And while most of this urban growth is occurring in developing countries, about half of the new population is being absorbed by the informal housing sector. By 2030-2040, estimates suggest that there will be 2 billion slum dwellers and slums will be housing about one third of the total urban population [Nations, 2007]. The recognition of slums as a menace to the "planned city" along with their high correlation with poverty have made slum improvement a priority for many local governments and international organizations. Slum and housing policies have multiplied, bringing new waves of thinking and original solutions that consider much more than just a house. Furthermore, recent studies have revealed that slum policies, by changing the living environment, might

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trigger other important positive changes as well as some unwanted side-effects. Among the stated benefits of slum policies are poverty reduction, higher gender equality, better access to credit and higher income generation [Aiga and Umenai, 2002, Cattaneo et al., 2009, Field, 2007].

This paper will focus on one of the possible side effects of slum rehabilitation policies: policy induced residential mobility. The idea that many of the slum dwellers move out after policies has constantly drawn the attention of both policy makers and researchers. On one hand, policies like titling or slum upgrading can be generators of higher mobility of households, who now can sell or rent their dwelling in the formal market. On the other hand, slum policies might be generators of forced mobility as some slum dwellers might be unable to face additional financial liabilities (taxes, maintenance, legal electricity) or have mismatching preferences with new living conditions (economic activities or household size). The latter might be forced to sell/rent and move back to slums. The Slum Rehabilitation Scheme (SRS), main slum policy of the city of Mumbai, will serve to illustrate the residential mobility analysis. This megapolis, despite being the economic capital of India, has half of its population living in slums and introduced an innovative slum policy based on a market approach.

The analysis of residential mobility is important in a number of ways. First, because without it the results of policy impact measurements are generally biased. If some people have moved out and others have replaced them, the measurement of policy effects will be bias as the study group will be composed of real beneficiaries and *new comers*. Second, because by studying residential mobility it is possible to have insight of what is working and what is not. If slum dwellers are still unable to afford and sustain themselves in the new living conditions, informality might be linked to both to an access (entering formality) problem as a sustainability issue (staying in formality). Finally, residential mobility analysis is essential to measure accurately the policy effect in terms of net slum-absorption and policy completion. If mobility is associated with high rates of *poverty recycling* the policy is simply displacing the slum.

The main question in this paper is why some households move out of the rehabilitated buildings while others manage to stay and what are the overall effects of the policy - considering residential mobility - in terms of net slum resorption. The analysis will be based on a household survey carried out by the author, comprising 510 household in 9 slum pockets. The rest of the paper is organized in the following way. The second section reviews residential mobility theories adapted to low income households and slum settlements. The third section gives a description of the main features of the Slum Rehabilitation Scheme, a brief outline of the methodology used in the survey and shows some evidence of residential mobility post-rehabilitation. The fourth section analyzes the determinants of residential mobility and tests the thesis of poverty recycling base on household survey results. Finally, in the fifth section conclusions are outlined.

2 Residential mobility

2.1 Low-income household's mobility

Residential mobility is a common subject present in economic journals but most of the literature deals with residential mobility in developed countries and concerns only the formal housing sector. There are however a series of articles (Edwards, 1983,Gilbert and Ward, 1982,Gilbert, 1999) in the 80s in which mobility of poor households was studied. Most of these studies sought to test a series of hypothesis established earlier by Turner [1968], that suggested a common residential mobility pattern behind poor migrants urbanization. According to Turner, low-income household's choice was a function of three variables: (1) tenure or the choice between renting and owning; (2) location or the proximity to employment opportunities; and (3) shelter or an individual preference of having modern standard housing. His observations suggested that poor migrants (*bridgeheaders*) initially had low preferences for ownership and opted for cheap rental accommodation but gradually integrated the city becoming *consolidators*.

The simplicity of the two-stage Turner model was latter contradicted by a series of empirical studies that evoked that to fully understand low income household's residential mobility, both preferences and constraints needed to be taken into account[Gilbert and Ward, 1982]. Poor households might have high preferences for ownership but remain unable to afford buying a house. These studies also suggested that the living environment played a fundamental role in the moving decision. According to Edwards [1983] *"residential mobility among poor families is as much a reaction to changing conditions in the housing market as a response to variations in household demand"*.

Leaving aside the effects of the living environment on residential mobility, the analysis of the determinants of "moving out" can also be done with the use of housing choice theory. As [McFadden et al., 1978] explain, household's utility when choosing a given housing solution depends not only on the housing attributes but on household's characteristics. Under this scope, residential mobility cannot be described by a general trend of low-income migrants which are identical in preferences and constraints but as an individual response of households to changes in their preferences (utility) and income (or budget constraint). Households mobility might be associated to changes in family size or structure, or be the product of new financial circumstances. Mobility might be avoided - in some cases - by adapting housing attributes to preferences, as done in many Latin America cities in which low income households build additional floors. However, attributes adaptation is in most cases restrained by space, housing structure or local municipalities. For instance, improving household connection to water services needs higher levels of community cooperation or political initiatives, and can rarely be the product of an individual household decision.

Residential mobility in informal settlements, excluding the cases of forced eviction, is generally restricted due to incomplete tenure systems. As slum dwellers don't have traditional rights over their houses, selling or renting is risky and can only be achieved through common agreements[De Soto, 1990]. Lall et al. [2006] provides evidence, from slums in Bhopal, that suggest that even when slum dwellers have attained a certain security of tenure they seem to remain incapable to capitalize the value of their dwelling and move to formal housing. Gilbert [1999], found that residential mobility of owners in consolidated low-income settlement in the city of Bogota(Colombia) is also extremely limited. Furthermore, recent empirical studies point out that when slum housing markets exist there

seems to be very restricted vertical integration with traditional housing markets (slum to formal and formal to slum mobility) (Gulyani and Talukdar [2008], Lall et al. [2006]).

Though there is little quantitative information of mobility changes following slum policies there does seems to be a great amount of anecdotal evidence in the literature. Three studies, in Delhi, Cairo and Cape Town, suggest that around 10-30% of the slum *original occupants* move out after the slum policy [Payne, 1977, Barry, 2006, Jacobsen, 2003] (AUTHOR). And while the little literature has given the idea that residential mobility after slum policies might be considerable, there is little evidence to support the theory of poverty recycling since the type and location of destinations of those who left remains unknown.

3 Moving in

3.1 Slum Rehabilitation Scheme

Slums have made a part of the city of Mumbai for a long time. They emerged in the mid-nineteenth century and by the time of India's independence the city had already 5% of the population housed in this type of habitat. Since then, slums have grown considerably both in absolute and in relative terms. The total slum population passed from 2.8 millions in 1976 to 6.2 millions by the year 2000 [MCGM, 2005]. The latest report, estimated that 55% of the city population lived in informal settlements while occupying only 16% of the city land [Hagn, 2006], a clear evidence of overcrowding and spatial inequalities of this megapolis. Living conditions in Mumbai slums are variable but most of the settlements are relatively old and have achieved a certain degree of consolidation. In terms of surface, slum dwellings are quite small, with 42% having 10 sq.mts, 38% between 15-20 sq.mts and only 9% above 20 sq.mts [Montgomery and Yuva, 2001]. Most houses are constructed with *pucca*[1] materials but the provision of basic services varies considerably in each zone.

The current Slum Rehabilitation Scheme is the product of years of "learning by doing" and a result of the evolution of slum policies in the city of Mumbai. In 1976, the first census of slums was done and in 1983 a task force was created to discuss housing and urban development issues. Despite the recognition of slums, the predominant policy in the 70's was forced demolition and clearing of slum settlements. This policy has, unfortunately, not been completely eradicated from the city. From 1985 to 1991 three different slum policies were implemented: the Slum Upgrading Program (1985-1991), the Prime Minister's Grant Project (1985-1991) and the Slum Redevelopment Scheme (1991-1995). However, none of them achieved significant results in terms of slum absorption [Mukhija, 2001].

As a result a new policy was introduced in 1995 called the Slum Rehabilitation Scheme (SRS) to substitute the Slum Redevelopment Scheme. The SRS created a better mechanism for cross-subsidizing slum projects using two types of incentives: Additional Development Rights (ADR) and Transfer Development Rights (TDR). It works in the following way. First, a builder or developer associates with a slum community and collects signatures of agreement

[1] *A pucca structure is one having walls and roofs made of pucca materials. Cement, burnt bricks, hollow cement/ash, bricks, stone; etc constitute the list of pucca materials. NSS Report 486 "Condition of Urban Slums: salient features"*

of at least 70% of the eligible slum dwellers. Second, the project needs to follow a set of administrative procedures at the Slum Rehabilitation Authority (SRA) which is a centralized agency created to manage the SRS. Once the project is approved, slum dwellers are relocated in transit camps, the slum is demolished and new buildings are constructed following a standard procedure. As construction finishes slum cooperatives are formed and tenements are allotted. Slum dwellers get free housing, with basic amenities and legal titles. The builder is compensated in two ways. If there is enough space to build additional housing units, the constructor is granted ADR. These allow the constructor to exceed standard Floor Space Index (FSI) regulations, constructing additional housing units in the same site which he can sell on the free market gaining profits. For example, if the project is located in the suburbs for every FSI use for rehabilitation 1 FSI in form of ADR is granted. There is however a maximum level of FSI that cannot be exceeded which brings us to the second form of compensation. If there is not enough space to use all ADR, the constructor is granted TDR which he can sell on the market and other constructor can use to build additional space in another project in the city[2].

3.2 Evidences of mobility following slum rehabilitation

In order to analyze household's mobility in Mumbai, three different sources of information will be taken into account. The first two, carried out by the Tata Institute of Social Sciences, will be used as a reference for comparison of abandonment rates while the third, carried out by the author, will be the base for the analysis of mobility determinants and abandonment destinations. The survey carried out by the author in cooperation with the Slum Rehabilitation Society comprises a sample of 510 households spread over 9 slum pockets. This survey was carried out to fill-in the blanks of the previous two surveys and answer a series of existing questions present in slum studies literature. Apart from residential mobility, issues like time allocation, education, access to credit and basic services provision were taken into account. Since the two available studies only had household data post-rehabilitation, two types of settlements where sampled to have a benchmark comparison. The first - referred as the *treated* group - corresponds to 4 slum pockets that have already benefited from the SRS policy, the second - referred as the *control* group - corresponds to 5 slum pockets that are in the process of being rehabilitated. At the time of the survey most of *control* group settlements had already collected 70% or more of the required signatures and passed administrative procedures at the SRA to prove eligibility of slum dwellers. To assure equivalence between *treated* and *control* groups, sites were chosen from a universe of settlements based on a series of characteristics (household structure, area, tenure and basic services). The final group of settlements selected was very similar: around 60% gained area after rehabilitation, most of the slum houses structures were made of durable materials and a very small proportion had separate bathrooms, inside piped water connection or toilets. For the purpose of this article, households that didn't belong to the original group of beneficiaries will be referred as *new comers.* Households that benefited from the initial policy will be referred as *original occupants.*

New comers were differentiated from *original occupants* using a test questionnaire where households were asked a series of questions on their previous and current living conditions. When the test questionnaire result was positive,

[2]For more information on SRS incentive mechanisms please refer toChandy, 2007

Table 1: Survey methodology and abandonment rates

	Sample size (hhs)	Projects surveyed	Avg. years since rehabilitation	Sampling technique	Abandonment rate
SRA - TISS (2003)	2138	151	3.3	random (10% per project)	13.5%
MUTP - TISS (2008)	1505	3	2.3	random (~20% per project)	15.2%
Author's Survey (2009)	510	4	2.5	random (~35% per project)	9.2%

meaning that the household belonged to the *new comers* group, the interviewer moved to the *new comers module* to ask the occupants additional questions about their tenure status, their previous living conditions and relationship to *original occupants*. When the test questionnaire results were negative, interviewers moved to the following modules where more questions about the initial slum settlement were asked (basic services, type of housing, etc). At this point it was easy to identify if the test questionnaire had given a false negative, since most of the *new comers* were unable to respond to simple questions about their previous living status in the slum, and move to the *new comers module*. Before the real survey took place, 50 questionnaires where done in a settlement - different from the 9 slum pockets - to evaluate if the test and questions were actually working and assure that interviewers understood the methodology.

Table 1 describes sample sized and methodologies along with results for average abandonment rates and occupancy tenure status found in the three surveys. Differences between abandonment rates in each of the surveys might be explained by differences in the samples selection, survey methodologies and projects characteristics. In the MUTP project, slum dwellers were relocated to distant sites while two other surveys analyzed *in-situ* rehabilitation. Relocating slum dwellers in distant areas might have serious consequences in their incomes and increase considerable transportation costs, both of which might have effects on mobility.

Apart from differences in survey methodology, general observations suggest that the samples selected for each of the studies are quite different. The sample selected by the author was taken from slums that had achieved a high degree of consolidation - most of which had *pucca* structures - while only 20% of the SRA - TISS survey had *pucca* houses. Changes in the living environment, such as evolution in the housing market can also be source of divergence but it is not possible to account for this effect. In light of the above, abandonment rates presented in table 1 should not taken for comparisons but as an evidence of the phenomena that is taking place.

The SRA-TISS(2003) survey included two questions that asked policy beneficiaries how many times they had moved before rehabilitation and reasons for moving. Results indicate that for 78% of the policy beneficiaries, slum rehabilitation represented their first shift in dwelling which suggest that residential mobility before rehabilitation took place was very low and confirms existent literature.

4 Selling out

"For a poor squatter in the middle of the capital city, the promise of a title would seem to be a road to riches. In practice, it is more like a sign taped to his back that says, "kick me". John Gravois - The De Soto Delusion

4.1 The determinants of moving out

The literature of residential mobility explains how households decide to move following changes in their individual preferences, constraints or due to evolutions in the living environment. Therefore, to determine mobility causes following SRS in Mumbai, each of the aspects of the household choice equation will be examined. If the hypothesis of a constant household utilityis held, or that household preferences present little or no change when passing from the slum household to rehab tenements, the analysis of residential mobility can lay on changes in housing attributes and evolutions of households budget constraint. A broader approach, considering changes in the living environment like evolutions in the housing and job market is unfortunately beyond our capacity. One could argument that changes in the living environment affect all households equally but this affirmation is not exact since households living in the same area might be affected differently by the global crisis or the relocation of industrial companies in the periphery of the city. This lack of information will remain one of the downfalls of the analysis.

Changes in housing attributes

The Slum Rehabilitation Scheme produces radical changes in some of the housing attributes. As table 3 shows, SRS provides *pucca* structured houses, legal titles and individual access to basic services (water, electricity and sanitation). Around 80-90% of the households covered in our sample had *pucca* structures houses but only a small share had individual water connection, toilets and bathrooms. Changes in housing surface and structure seems to be more relevant than changes in tenure status both of which, as will be proved in the next subsection, can be generators of mobility.

Table 3: Changes in housing attributes for *treated* group following SRS

Attribute	Before	After
Construction materials	80-90% *pucca*	*Pucca house*
Surface	40% with areas >225 sq.ft	225 sq.ft
Structure	14.9% had Mezzanine or G+1	No vertical divisions provided
Tenure	96.9% said to be structure owners and only 2.6% said to be on rental basis	Ownership papers, transactions are forbidden for 10 years
Access to sanitation	94.7% didn't have bathroom inside and 99.6% didn't have individual toilets	Provision of separate toilet and separate bathroom
Access to water	Only 31.6% had individual water connection	Legal and independent connection to water
Electricity connection	97.6% had independent electricity connection	Legal and individual meters for electricity connection
Settlement structure	Village-type	3-5 multistories buildings

Source: author's survey (2009)

Changes in budget constraint

"There is no use having a beautiful house if there is no source of income to live a decent life" MUTP resettled household

Budget constraint equation defines what quantity of goods a household can buy based on goods prices and household salary. Lets suppose a very simple equation where households utility is a function of a composite non-housing good (*Nh)* and a housing good (H_t). If market equilibrium before rehabilitation is assumed, slums dwellers chose their previous housing maximizing their utility under their budget constraint.

$V_t = f(Nh_t, H_t)$; where V_t is households utility in time *t*, Nh_t corresponds to the non-housing good and H_t to housing good at time *t*.

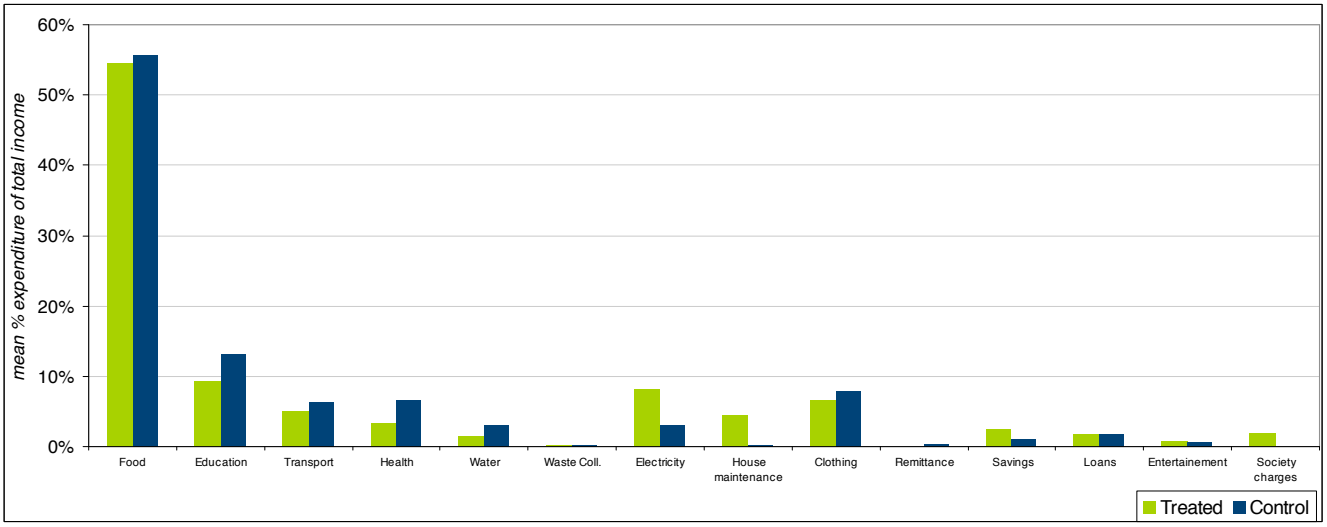
Housing good is composed of a series of specific attributes: (B_t) building structure, (Bs_t) provision of basic services and (S_t) surface. Households budget constraint is the following, assuming unitary price for non-housing good:

$W_t = Nh_t + p_{B_t}B_t + p_{Bs_t}Bs_t + p_{S_t}S_t$; where W_t is households revenue and p_B, p_{Bs}, p_S are attributes prices.

If one holds non housing good constant, utility is considered to grow with an improvement in housing attributes. Therefore *in-situ* slum rehabilitation is supposed to increase households welfare. This might not be the case for slum resettlement policies since the change of location inside the city might reduce households utility. However changes in consumption of housing attributes generated by the policy also affect the budget constraint equation. For instance, accessing legal basic service automatically generates changes in the right side of the budget constraint equation since unitary prices are adjusted to existent tariffs. At the same time, the SRS might also generate changes in the left side of the equation (revenue). The reallocation of time, previously used to collect water or to protect the house, to income generating activities has been evidenced in studies carried out by Field [2003] in Peru and Aiga and Umenai [2002] in Manila slums. Results from the authors survey also point in the direction of increased income through reallocation of time when *control* and *treated* groups are compared, suggesting that slum rehabilitation might be welfare improving. However no statistical analysis has been carried out so far to prove the significance of policy effect on income.

A comparison of household's consumption expenditure as percentage of income between *control* and *treated* groups can be seen in Figure 1. The rehabilitated (*treated)* group has considerably higher expenses in house maintenance, electricity and society charges than the slum *(control*) group. Society charges correspond to expenses paid to cooperative society in charge of the rehabilitation apartments which are normally used for maintenance of common spaces (corridors, lifts, etc). All of these items correspond to changes in attributes due to the SRS policy and associated with formal housing. It is interesting to notice that expenses in water services and solid waste collection remain about the same, however no information on quantity of water consumed was collected during the survey so no further conclusions can be made. According to observations made during field surveys, slum pockets were already served by Municipal Corporation which might explain little changes in water expenditure. In the case of waste disposal, evidence suggest changes in households practices, as the proportion of households throwing waste in nearby trash cans augmented from 75% before rehabilitation to 88% after wards and the proportion of households paying others to collect waste diminished from 13% to 8%.

Figure 1: Changes in consumer's expenditure



Source: author's survey (2009)

In the case of electricity, author's estimations suggest that *control* households have a higher per capita consumption (57,02 kWh/month.person) than *treated* households (48,09 kWh/month.person). This could be a consequence of the formalization of the electricity supply. Sharma [2008] results for the case of MUTP resettlement indicate that 77% of the families say to be paying more electricity than before. One of the highest increases in expenditure is the amount paid for maintenance and society charges, according to Bhide et al. [2003] 67.3% of the respondents found this increase to be sharp and unaffordable. Sharp increases in electricity and household maintenance are partly compensated by lower expenditure in health, education, food and transport. While transport and education expenditures may reveal specific of the households employment and the slum pocket location, health expenditure might actually reveal a positive indirect outcome of rehabilitation. A comparison between *control* and *treated* households from our survey shows that on average rehabilitated households work more days a week than control households and lose less days of work due to illness.

Households were also asked if they had problems facing end of months and shortfall frequency. According to results, around 25% of *treated* households and 39% of *control* household face shortfalls regularly. Capacity of households to save money was measured in the same manner. A higher proportion of households saving was found in the *treated* group and frequency of saving was also found to be higher. In general terms, the rehabilitation of slum dwellers in formal housing generates both changes in households expenditure due to associated costs like having legal electricity, but also seems to have effects on households income through reallocation of time. It is the magnitude of each of the effects that will define if households can maintain previous expenditures in new living conditions or decide to move due to unsustainable and unaffordable new expenditures.

The opportunity cost

Literature refers to slum policies generated mobility, mostly as a consequence of the cost of opportunity. When a slum dweller gets a formal ownership right, property value raises and so does the cost of opportunity. Payne [2001] arguments that the provision of land titles may increase property values and displace most vulnerable groups in favor of higher incomes. Gilbert and Varley [1991] explain how informal settlement that were once in peripheral or marginal location can now be found to be in strategic location given urban growth.

In each of the sites, households were asked to estimate the rental and total value of their houses. *Control* groups which still live in slums were asked about actual (slum) and future (rehabilitation) values while *treated* groups were asked about their previous (slum) and actual (rehabilitation) values. Since property value is not only a function of housing attributes but of location, groups were not merged and results are shown by site. As shown in Table 4, in all of the sites households estimate that the value of their houses doubles following rehabilitation. In absolute values, households that are still living in the slums tend to overestimate the value of rehabilitation tenements but in general terms the slum rehabilitation policy in Mumbai signifies a considerable transfer of physical capital to slum dwellers.

Table 4: Housing valuation

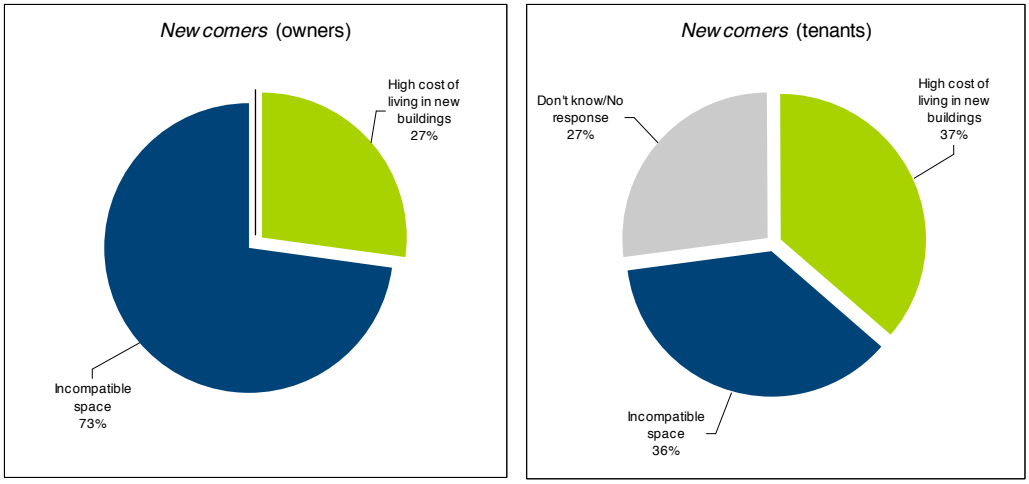
Group	Slum/rehab site name	Sell (Rs.)		Rent (Rs./month)	
		Slum	Rehabilitation	Slum	Rehabilitation
Treated	Sai Wadi	625 000	1 532 268	2 185	7 769
Treated	Sundar Nagar	635 000	930 000	1 279	3 313
Treated	Ganesh Nagar	581 539	1 509 700	1 327	4 250
Treated	Ashram Chawl	570 833	1 253 036	2 325	4 622
Control	Korba Mithagar	903 380	1 773 295	2 219	5 964
Control	Sundar Nagar II	788 842	1 766 667	3 698	5 079
Control	Betwala Chawl	603 000	1 800 000	3 100	17 250
Control	Godiwala Compound	663 333	1 600 000	4 143	7 000
Control	Waterfield Road	1 471 429	3 000 000	6000	7 750

Source: author's survey (2009)

4.2 The reasons for moving out

Previous discussions suggest that while changes in housing attributes are mostly for the better this usually come at a higher cost. If one plays with logic most of slum dwellers chose to live in slums either because they had an access problem - formal housing was unaffordable - or because they had a durability issue - unable to support the cost of living in it. Under this approach, slum households that have sufficient incomes to support new cost of living will probably be able to maintain sustainable trajectories. On the contrary, for households having both an access and a durability issue, sustainable trajectories post-rehabilitation will be possible only if the increase in income compensates the increased costs. When this is not the case households will quickly find themselves in a trap and will probably return to slums.

Figure 2: Reasons for mobility of *original occupants* by *new comers* tenure status



Source: author's survey (2009)

During the author's survey reasons for moving out of *original occupants* were asked to *new comers*. Figure 2 reveals incompatible living space and high cost of living as the two main reasons of mobility. Our results corroborate those found by Bhide et al (2003) who asked all of surveyed households (*new comers* and *original occupants*) what they thought were the main reasons for people moving out of rehab apartments. Although many were not able to respond, 27.5% of respondents thought that moving out was primarily due to the weak economic status of slum dwellers and the increased maintenance charges. Insufficient living area was also reported as a possible reason for mobility. While the first reason (unaffordable livelihood) reveals an alarming truth of how "normal standards" of living are simply not affordable for the poor, the second reason (incompatible living space) evidences a failure in the policy to meet household needs.

In fact, it seems that the standardization of the SRS policy - providing equal surfaces and housing structures regardless of original conditions - might be its Achilles heel. Local authorities argument that giving areas of 225 sq.ft implies an improvement for most of the slum dwellers but as the Slum Rehabilitation Society states four walls do not make a home. The rigidity of new houses poses a serious problem since modification of housing attributes is restrained. Differences in type of investments in housing done between *control* and *treated* groups evidence these limitations as 18.2% of *Control* groups investments in housing are used for structural changes (adding divisions, mezzanine or doors) while only 8.6% in the case of the *treated* group. Results also suggest that a good part of households investments in housing after rehabilitation are directed towards the acquisition of durable goods (electrical appliances and furniture).

The latter point how sometimes slum dwellings, despite their constant stigmatization, seem to provide more adaptable environments to household needs.Joshi [2006] states how "*The priorities of the slum dweller are frequently not those of the authorities or the developers. Space takes precedence over permanence, function over aesthetic. A*

porch may be built before a bathroom".

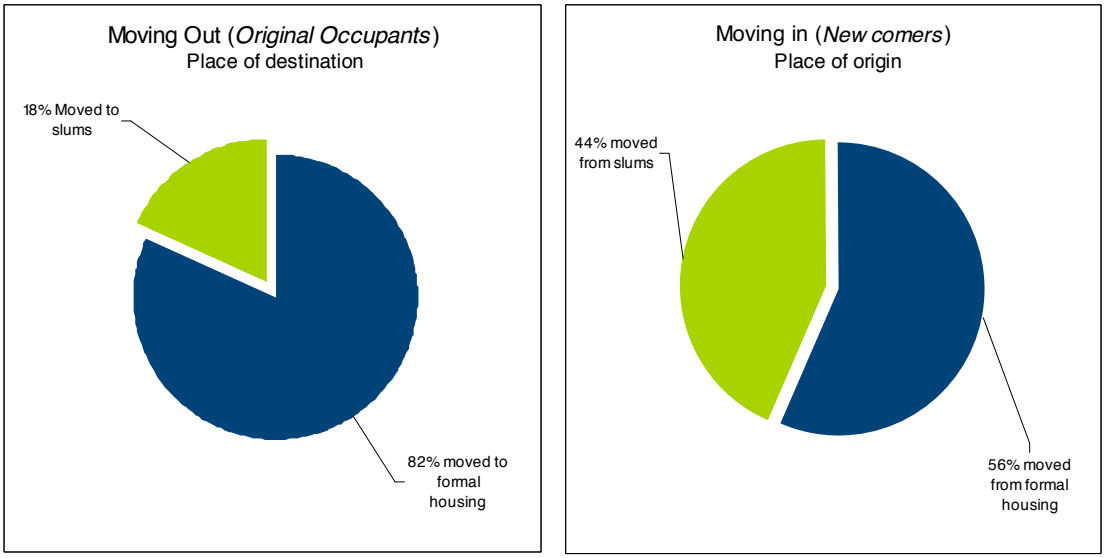
4.3 Recycling of poverty

Previous findings suggest that mobility post-rehabilitation is in many cases associated to a recycling of poverty. The poorest of slum dwellers move to rehabilitation apartments and find themselves unable to support higher cost of living and are forced to move out to slums. But what is the magnitude of this recycling and is it seriously damaging the overall efficiency of the policy? In order to answer both of these questions it is necessary to know both *original occupants* destinations and *new comers* provenance. Net slum absorption is given by the total of rehabilitated households minus poverty recycled households plus *new comers* coming for slums, or:

Net Slum Absorption = Rehab.households - Rehab.households went back to slums + new comers that previously lived in slums

In the author's survey *new comers* were asked about their previous place of living and about *original occupants* destination. Figure 3 shows how 43.5% of *new comers* were previously living in slums and that most of the *original occupants* moving out are living in formal housing. Out of all the households leaving 18.2% went back to live in slums. Curiously it seems that mobility post-rehabilitation is actually increasing the net absorption rates by allowing additional slum dwellers to enter formality. *New comers* were also asked the time they spent in their previous residence and results indicate that around 72.7% had only spent 5 years or less in their previous houses. This means that most of slum *new comers* are not eligible as beneficiaries given policy deadline (1st January 1995).

Figure 3: Net absorption rate



Source: author's survey (2009)

Interestingly, actual status of tenure differs according to *new comers* origins. As 72.7% of those previously living in slums are now tenants and 90.9% of those previously living in formal housing are now owners. In the case of *original occupants* 36.4% of those renting their apartments moved back to slums and 45.5% to formal housing while 100% of those selling their houses moved to formal housing (either in the city or outside of it). Both of which can be associated to the level of income of the household, as *new comers* on rental status are on average poorer than *new comers* who bought rehabilitation tenements. The following table shows a comparison of general indicators of *control, original occupants* (treated) and *new comers* groups. Results show how *New comers* are very similar to *original occupants* but seem to belong to a slightly richer income group. A comparison between *control* and *treated* groups evidences a diminution of household size and positive displacement of the income distribution post-rehabilitation. While the proportion of children with less than 5 years suggests a diminution of fertility post-rehabilitation, smaller household size can also be associated with individual "invisible mobility". To cover for this, all *treated* households were asked if they had lost members after rehabilitation. Results indicate that only 3.5% of *treated* households had lost members following rehabilitation and most of them left the household due to marriage. The latter contradicts the hypothesis of "invisible mobility" and suggests that most of the reduction in household size is explained by diminished fertility.

Table 5: *Original occupants & New comers*

	Control	Treated - *Original occupants*	*New comers*
Household size	5.23	4.89	4.30
Proportion of children $<$ 19 years	1.33	1.07	1.36
Proportion of children $<$ 5 years	0.33	0.22	0.17
No. earners	1.71	1.58	1.87
% permanently employed	28.7	33.1	39.4
Monthly income (Rs.) - % households in range			
0-2500	5.4	1.7	0.0
2501-5000	26.0	10.9	9.1
5001-7500	20.7	21.8	9.1
7501-10000	26.0	28.2	18.2
10001-12500	11.6	23.6	45.5
more than 12500	10.9	14.1	18.2

Source: author's survey (2009)

5 Conclusions

This paper has presented new evidence on how slum policies impact slum dwellers livelihoods using residential mobility as an indicator. There are three major findings. First, the household survey - as well as the two other surveys available - confirmed the hypothesis of policy induced residential mobility. Abandonment rates after two and a half year of rehabilitation are around 10% which is considerable when compared to the insignificant rates of

residential mobility before the policy takes place.

Second, the post-rehabilitation mobility analysis revealed that in some cases the benefits of rehabilitation are outstripped by additional costs associated to new living status. In the case of *in-situ* rehabilitation, mobility was found to be associated to two factors: a mismatch between household needs and new housing attributes; and an incompatibility between the high cost of living and households economic status. Results indicate that the first factor dominates since most of the *original occupants* moved out to formal housing and not back to the slums.

Third, post-rehabilitation residential mobility was found to be linked to higher slum absorption rates. While this is certainly a good thing, the generalization of this result is not automatic. Slum resettlement policies, in which slums are relocated at distant sites might have higher proportions of residential mobility associated to *poverty recycling* due to greater impacts on the right side of the budget constraint equation (ie. transport) and negative impacts on the right side of the equation (ie. loss of employment). Furthermore, slums selected by the author's had achieved a certain degree of consolidation, and slum rehabilitation in less consolidated slums might conduce to higher rates of *poverty recycling*.

Finally, throughout this paper it has been have proved how the analysis of residential mobility and abandonment destinations can be used not as an indicator of sustainable policy trajectories but as an indicator of the mechanisms of slum formation in a given city. Slum choice, according to results, is not only linked to formal entry barriers (accessing formal housing) but to a durability problem (cost of living in formal housing).

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